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PATENT SPECIFICATION



Application Date: April 13, 1931. No. 10,880/31.

378,890

Complete Accepted: Aug. 15, 1932.

COMPLETE SPECIFICATION.

Improvements in Sedimentation Apparatus.

I, WILLIAM WARREN TRIGGS, of the firm of Marks & Clerk, 57 & 58, Lincoln's Inn Fields, London, W.C.2, a British subject, do hereby declare the nature of this invention (a communication to me from abroad by The Dorr Company, a corporation organized and existing under the laws of the State of Delaware, United States of America, located at 247, Park Avenue, City, County and State of New York, United States of America), and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to sedimentation apparatus of the kind having a tank and means for removing the settled sludge.

The object of the invention is to provide an improved form of apparatus of the above kind, having certain features of novelty that will become apparent further on in the description, which makes the apparatus more efficient than that known.

The invention consists in the provision of a settling apparatus comprising a tank and a sludge scraping device movable by a traveller, which latter is caused to move on a guide associated with the tank and in which provision is made to counteract the lateral pull of the scraping device on the traveller.

The means for counteracting the lateral pull of the scraping device on the traveller preferably comprises a weight on the traveller.

In a preferred embodiment of the invention the scraping devices comprise chains stiffened by wire rope.

Further features and objects of the invention will be brought out in the following detailed description with reference to the accompanying drawings in which are illustrated several forms of the apparatus by way of example and in which:—

Fig. 1 is a plan of a rectangular sedimentation tank having an irregular bottom surface;

Fig. 2 is a sectional elevation viewed from the line 2—2 of Fig. 1;

Fig. 3 is a detail of the chain;

Fig. 4 is an end elevation of the

traveller partly in section as viewed from the left of Fig. 6;

Fig. 5 illustrates in perspective the method of securing a cable to the traveller;

Fig. 6 is a side elevation of a traveller;

Fig. 7 is a plan of a tank having a bottom different from that shown in Fig. 1;

Fig. 8 is a sectional elevation of the sludge removal conduits;

Fig. 9 illustrates details of constructions.

With particular reference to Figs. 1—6, a rectangular sedimentation tank 11 having a bottom 12 is provided with sludge discharge openings 13 and side and end walls 14 and 15 respectively. The tank bottom 12 is provided with a plurality of sludge collecting hoppers 16, each of which has its discharge opening 13.

Fixed to the tank walls 14 and 15 are the brackets 18 which support a rail 17, on which are supported the travellers T adapted to move thereon. Extending entirely around the periphery of the tank 11 is a chain 20 fixed to and carried by the travellers T and guided in its movement around the tank by the pulleys 21. The chain 20 is fastened to the traveller T so that when the chain is moved by the engagement of its links 50 with the teeth 51 on the driving sprocket 22, the motor 23 and the gearing 24, the chain and traveller move simultaneously. One or more travellers T may be used and when two are used they are preferably located at points on the chain diametrically opposite each other.

One end of a cable 26 is attached to the traveller T by means of a bracket 32 and a clevis 33. A counterweight 41 suspended on a rod 40 is hung from the clevis 33 to steady the cable when it is moved. A plurality of loops 42, 43, 44, 45, 46, 47, 48 are attached to and suspended from the cable 26 and are sufficiently long that when the cable 26 is moved around the tank by the travellers T the loops drag on the tank bottom 12. Each loop is made preferably of a portion of chain stiffened by a wire rope 49

in order to keep the loops from becoming tangled and to hold them in an open position for collecting the settled sludge.

The other end of the cable 26 may be attached to a rotatable collar 52 supported on a pin 53 upstanding from the tank bottom as shown in Fig. 8.

With reference to Figs. 4 and 6, the travellers T are made up of two body portions 27 and 28, each of which is carried by the connecting yokes 29 depending from two pairs of rollers 25 adapted to engage and roll upon the rail 17. Below each of the body portions 27 and 28 a link 30 surrounds a reduced portion 30<sup>1</sup> of the bracket 32 and serves as the means for connecting the chain 20 and the travellers T. The links 30 are pivotally connected by the draw bar portions 31 and with them form the chain 20.

A frame 34 is secured at one end to the bracket 32 and is adapted to carry the weights 35 which may be varied as required. These weights serve to steady the movement of the travellers and to hold them in a vertical position against the lateral pull of the cables 26. The other end of the frame 34 is supported by means of a bracket 36 having a shaft 37 extending from it to the bracket 32. The shaft 37 is supported by a roller 38 journaled in a pivoted yoke 39 depending from the traveller body 28. In passing the rounded corners of the tank the traveller body 28 will, by means of the roller 38 and the rod 37, be free to move toward or away from the traveller body 27, thus preventing undue strain in the chain 20 as shown in Fig. 3.

As shown in Fig. 7 there may be a single sludge outlet conduit 57 which carries off the sludge from the discharge openings 54 and 55 connected by a conduit 56. The discharge openings are located at a predetermined distance from the center of the tank 11 so that they will be in that part of the path of the cable 26 where the greatest amount of sludge is collected.

As illustrated in Fig. 9 the sludge scraping device may be partly rigid and partly flexible such as a scraper 67 comprising a plurality of blocks 68 having slotted ends 69 into which is fixed a flexible connection 70 of any suitable material; these blocks 68 are connected to form scraper loops, for settling apparatus as shown in Figs. 1 and 7.

It will be seen from the above description that when the chain 20 and the travellers T move around the tank the cable 26 and its depending loops will sweep the entire tank bottom and will, therefore, collect all of the settled sludge.

The construction and arrangement dis-

closed herein are by way of example and obviously modifications and changes may be made without departing from the spirit and scope of the appended claims.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. Settling apparatus comprising a tank and a sludge scraping device movable by a traveller, which latter is caused to move on a guide associated with the tank and in which provision is made to counteract the lateral pull of the scraping device on the traveller.

2. Settling apparatus according to Claim 1 in which the provision for counteracting the lateral pull comprises a weight on the traveller.

3. Settling apparatus according to either preceding Claim wherein the scraping device is connected with the traveller in close proximity to the guide.

4. Settling apparatus according to any preceding Claim in which a flexible cable for a plurality of sludge scraping elements is connected with the traveller in close proximity to the guide.

5. Settling apparatus according to any preceding Claim wherein the tank is rectangular in form and provision is made to permit the passage of the traveller around the corners of the tank.

6. Settling apparatus according to any preceding Claim in which the traveller is driven by means of an endless chain or equivalent.

7. Settling apparatus according to any preceding Claim in which the traveller is mounted on the guide by a plurality of supports at least one of which is movable relative to the traveller.

8. Settling apparatus according to any preceding Claim in which the scraping device comprises a plurality of flexible scrapers.

9. Settling apparatus according to any preceding Claim in which the scraping device comprises chains stiffened by wire rope.

10. Settling apparatus according to any preceding Claim in which the sludge scraping device is of looped form, provision being made to prevent entanglement of the loops.

11. Settling apparatus according to any preceding claim wherein a discharge outlet for the tank is provided eccentric of the tank bottom.

12. Settling apparatus substantially as described with reference to Figs. 1 to 6 and Fig. 9 of the accompanying drawings

13. Settling apparatus substantially as described with reference to Figs. 7 to 8 and Fig. 9 of the accompanying drawings.

Dated this 13th day of April, 1931.

MARKS & CLERK.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1932.

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Fig. 1.

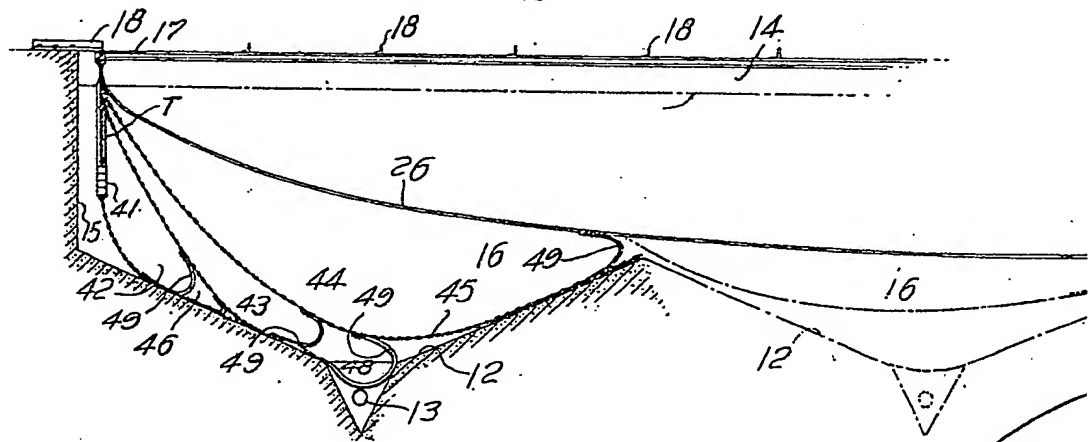
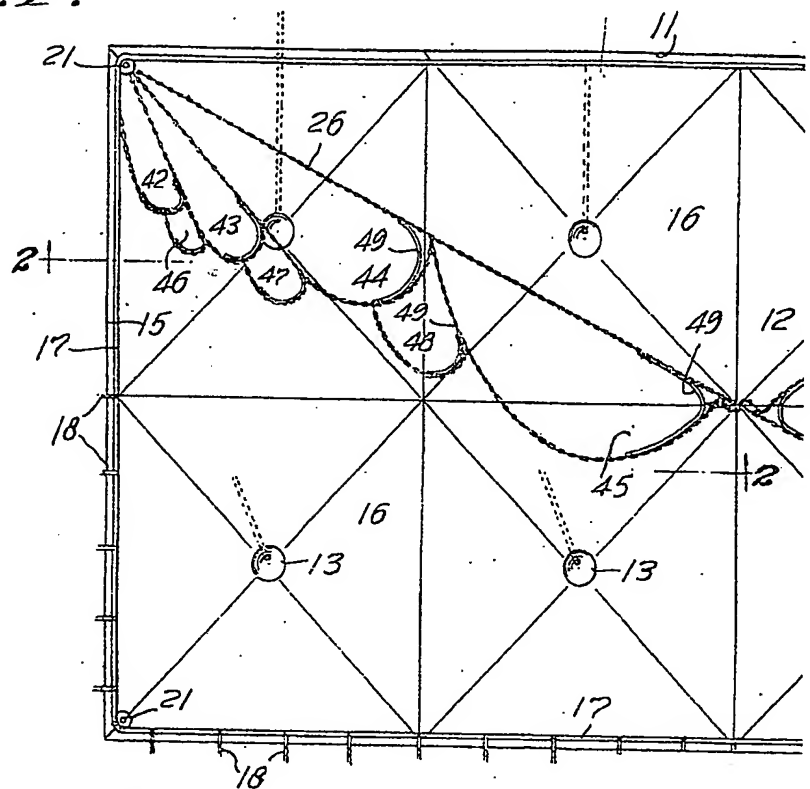


Fig. 3.

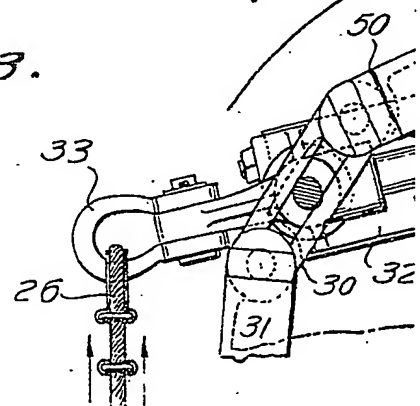
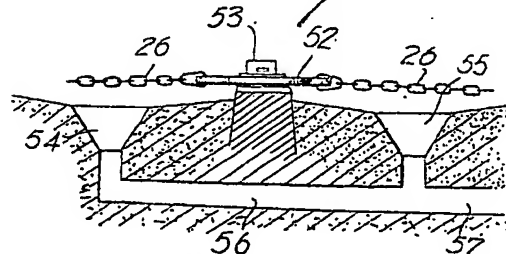


Fig. 4.



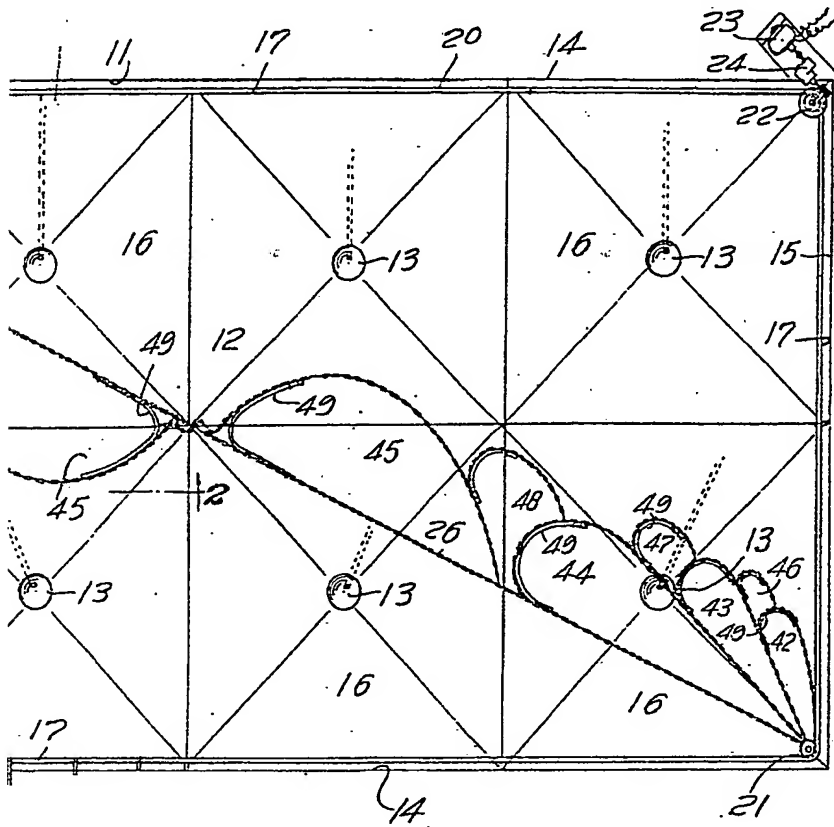
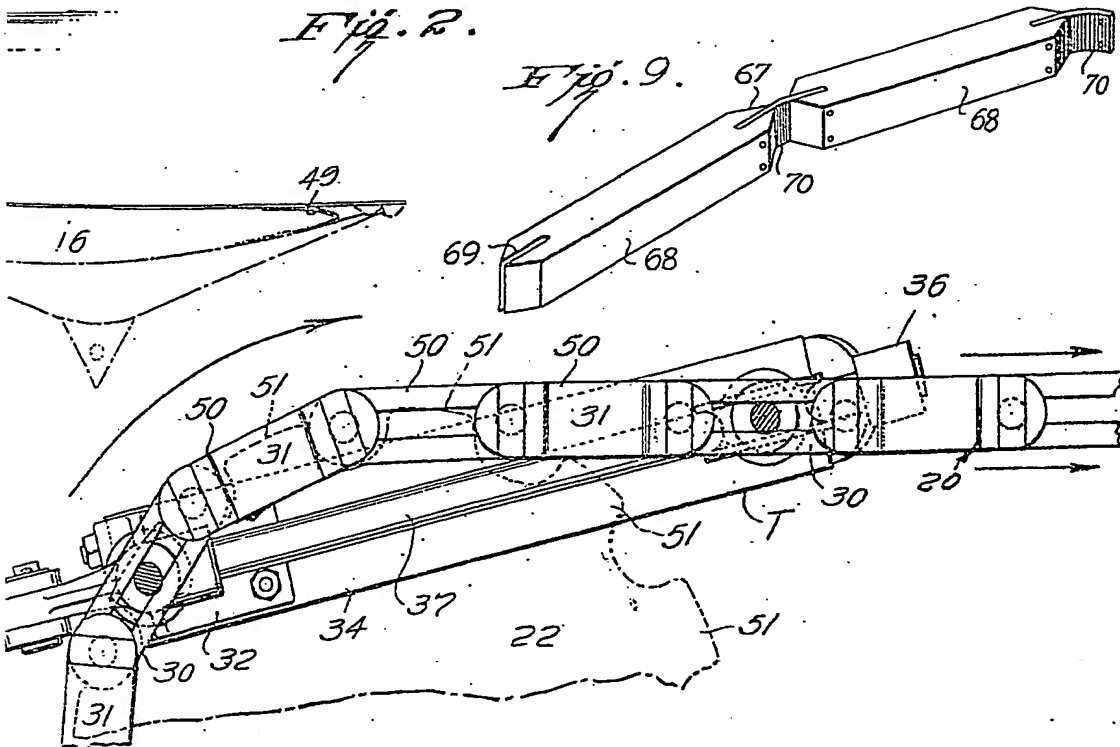


Fig. 2.

Fig. 9.



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Fig. 1.

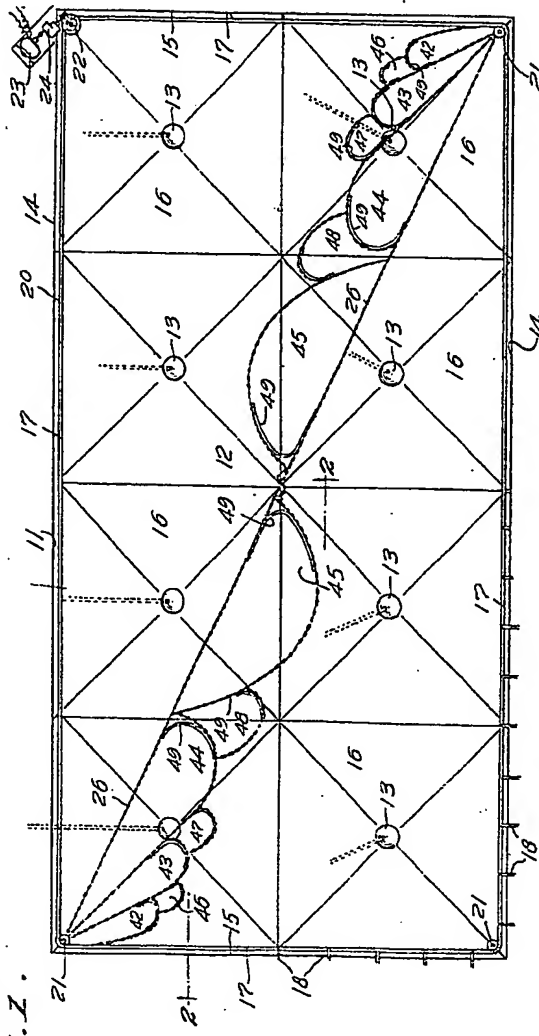


Fig. 2.

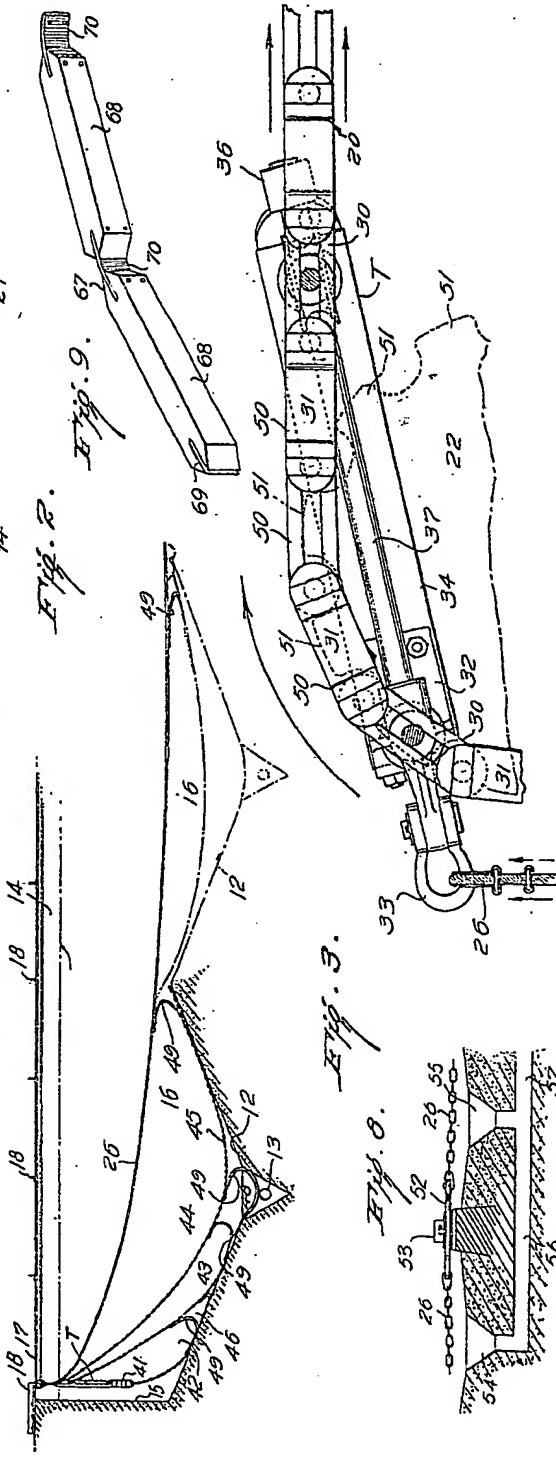


Fig. 3.

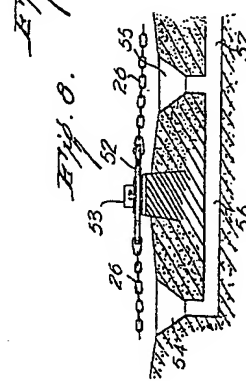
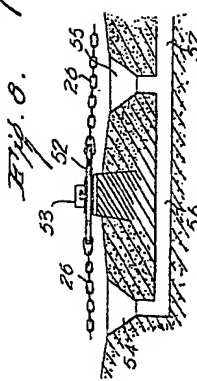
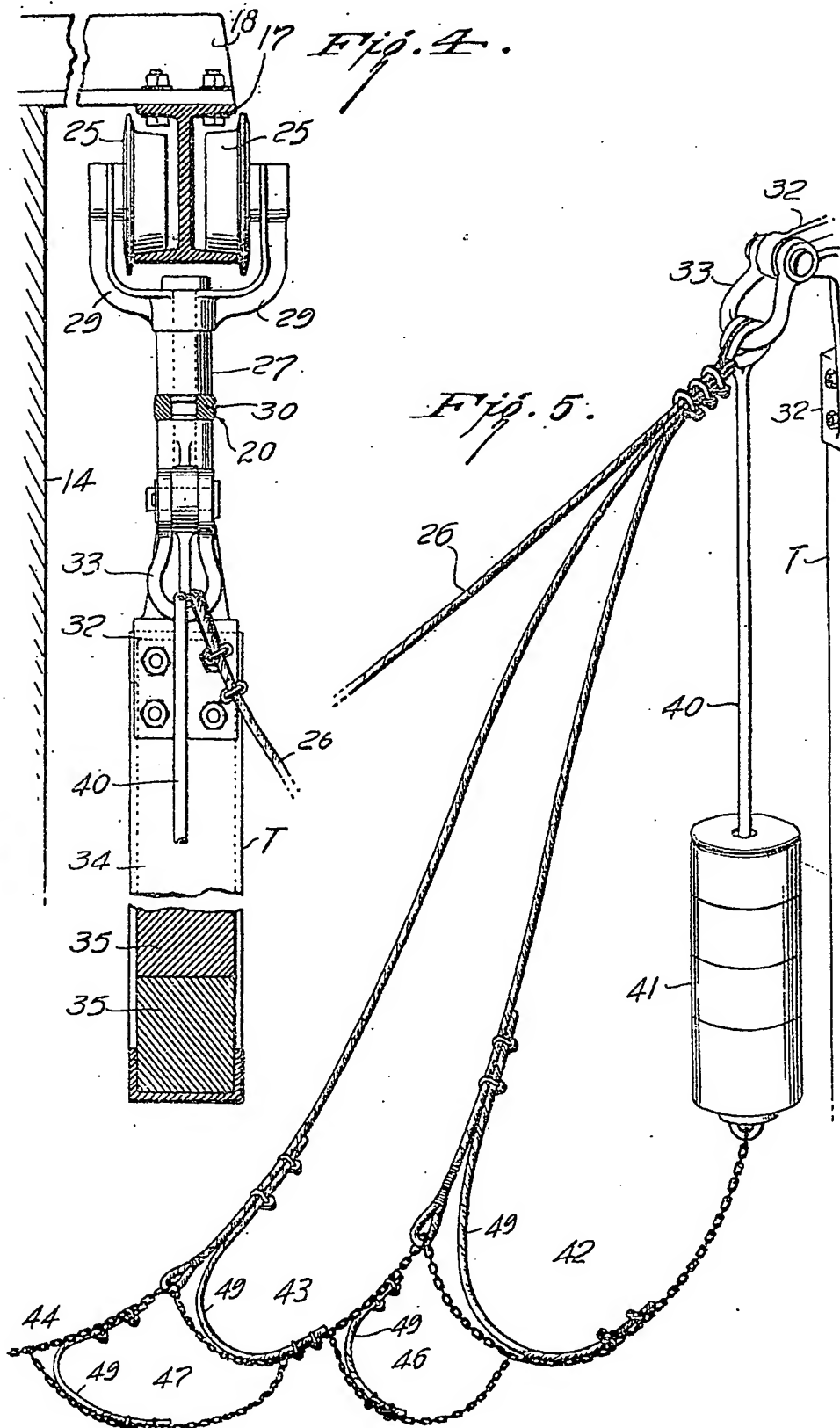


Fig. 4.



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Fig. 6.

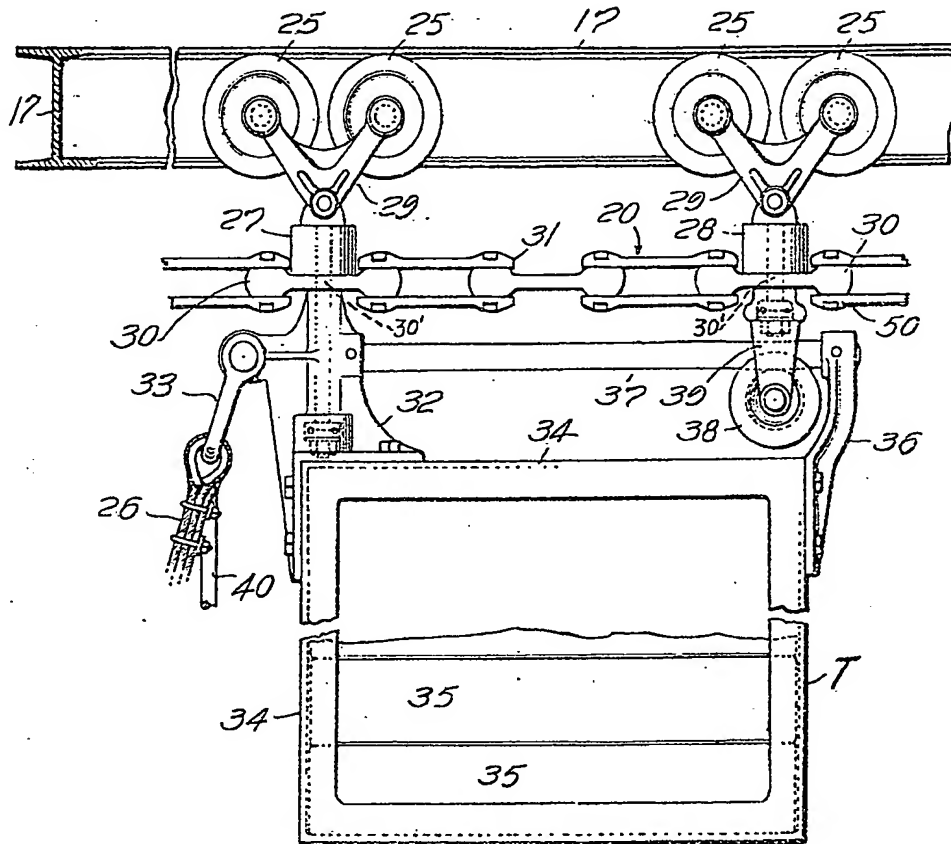
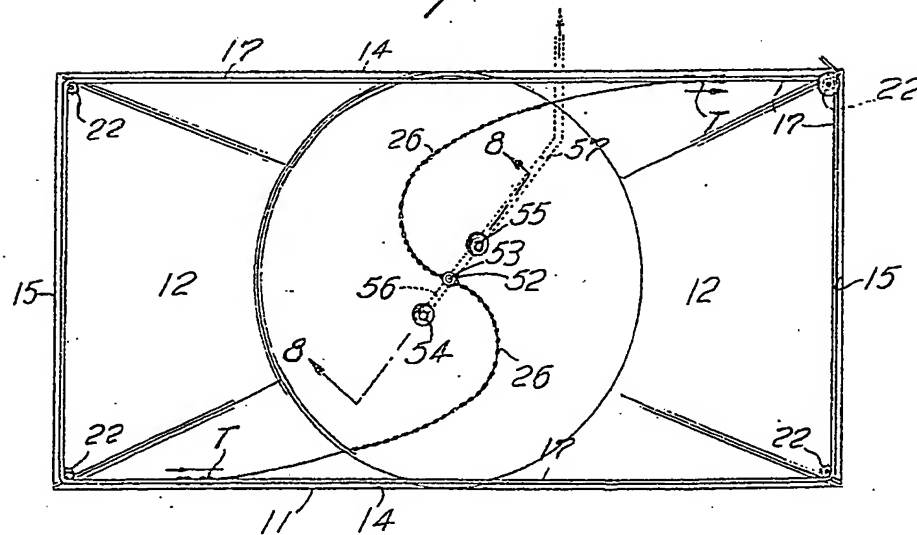


Fig. 7.





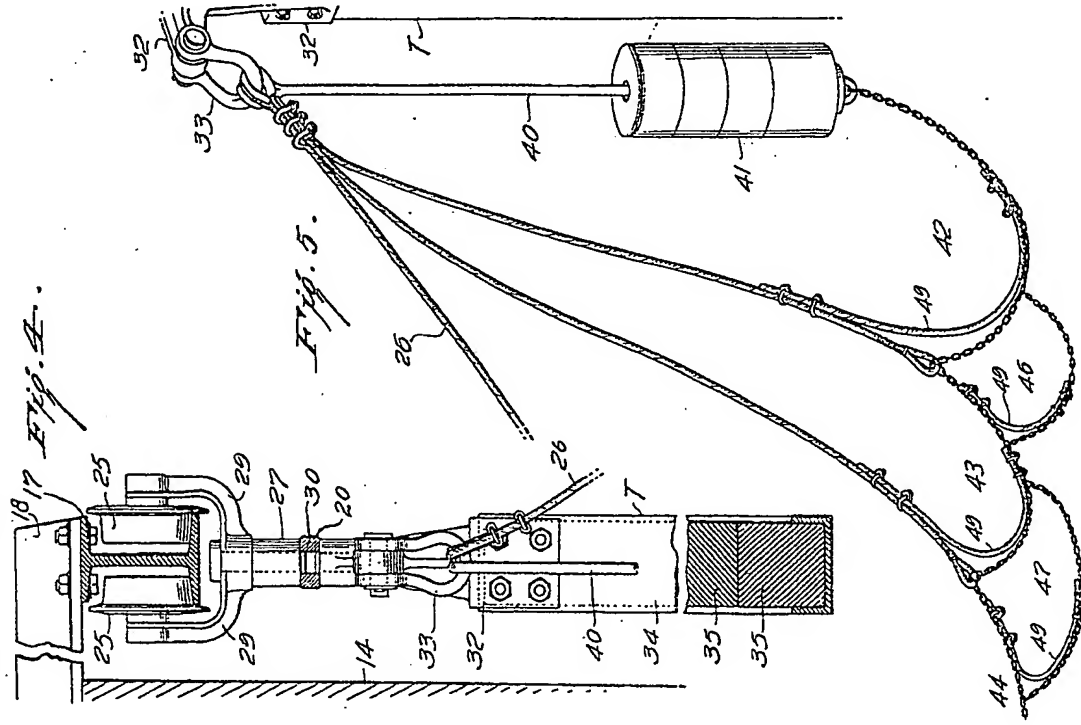


Fig. 5.

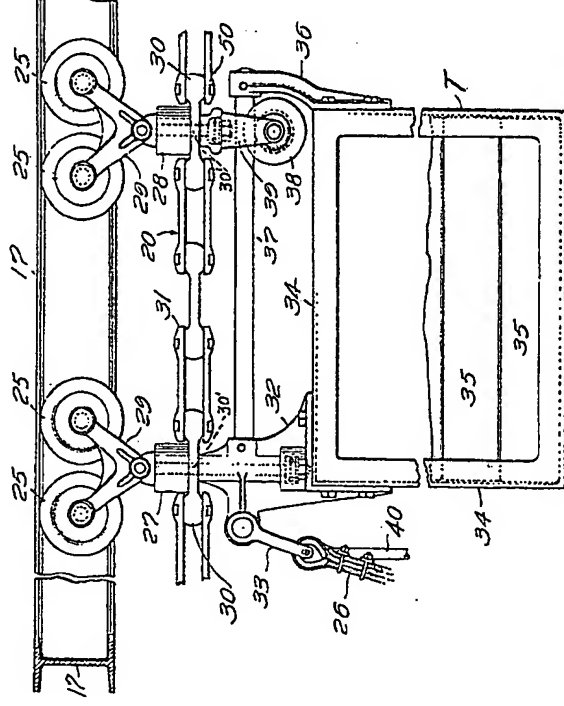


Fig. 6.

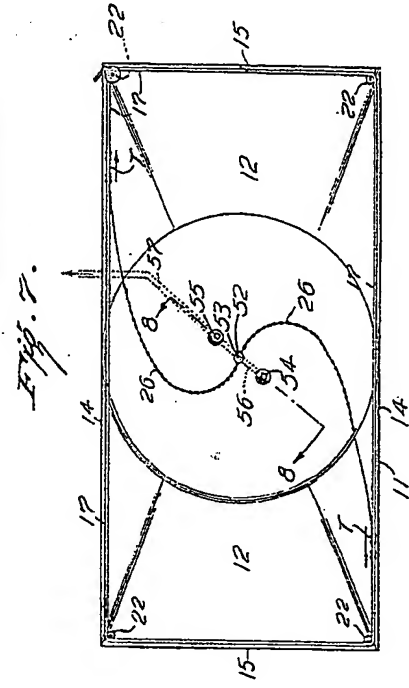


Fig. 7.

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